

and instruments employed in applying the ligature to uterine polypi, as, for the most part, they possess only a historical interest. With very few exceptions, they are all faulty in being difficult of application, in tending to produce violent irritation of the neighbouring parts, and in the ligature being unable to be removed until the pedicle of the tumour is entirely divided.—*Lond. Journ. Med.*, July, 1850.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

55. *Ethereal Oil of Bitter Almonds.* By Prof. MITSCHERLICH.—Owing to the difficulty of entirely freeing this substance from Prussic acid, physiological experiments hitherto performed with it have given very different results. M. Mitscherlich has recently undertaken a series on rabbits, which confirm the observations of those inquirers who state that its dangerous effects are proportionate to the amount of Prussic acid which still continues combined with it, and that, when freed from this, and given in doses in which the unfreed oil quickly kills, it scarcely excites any more powerfully poisonous effects than do the other essential oils. The conclusions are:—

1. Bitter-almond oil is a poison in large doses. It acts more feebly than ethereal mustard oil, but more strongly than the ethereal oils of savine, cinnamon, nutmeg, fennel, turpentine, juniper, or balsam of copaiba. 2. It is re-absorbed in the stomach, and in part excreted by the kidneys and lungs. Given in small doses, it may, according to the experiments of Wöhler and Frerichs, be oxidized in the economy, and converted into hippuric acid. In larger doses, the oxidation is incomplete, and a portion of the unchanged oil is found in the urine and expired air. 3. The most remarkable effects which fatal doses produce are, the rapid annihilation of voluntary motion and sensation; the respiratory movements and action of the heart; both of which are accelerated by this poison still continuing. 4. It produces the same changes in the intestinal canal as the other ethereal oils do. 5. When not freed from Prussic acid, it acts almost entirely by reason of its presence. The pure oil, given in doses of a scruple, does not produce any essential symptoms, but in larger doses it acts as the other ethereal oils.

The fact of this oil being employed in the manufacture of confectionery and perfumery invests these conclusions with a practical importance.—*Brit. and For. Med.-Chir. Rev.*, July, 1850, from *Buchner's Rep.*

56. *Poisonous Effects from Zinc.*—It is now some time since it was proposed by M. Leclaire to use oxide of zinc as a substitute for white lead, with a view to avoiding the dangerous effects of the latter on the workmen. There could be little doubt that, in point of salubrity, oxide of zinc was an improvement on carbonate of lead; but it was still a matter worth determining to what extent the oxide of zinc was itself free from objection, and whether or not some precautions were necessary regarding its use.

M. FLANDIN endeavoured to determine this experimentally. He rubbed animals over with ointments of oxide of zinc, of carbonate of lead, and sulphate of lead; and whilst he found that the two last always produced poisonous effects, he observed that the animals rubbed over with the oxide of zinc continued to enjoy their usual health. The following facts, however, show that the innocuousness of oxide of zinc must not be admitted so decidedly as Flandin supposes.

I. *Poisoning by Oxide of Zinc, used as a substitute for White Lead.* By Dr. BOUVIER, of the Hôpital Beaujon. A man, aged forty-two, a labourer, entered on 19th April with all the symptoms of metallic colic. He had been employed for the fifteen previous days at a white colour manufactory, along with five other workmen, in barreling oxide of zinc, and in repairing casks which had contained that substance, during which operation they were exposed to an atmosphere loaded with the powder of the oxide. From the commencement of their work, he and his comrades experienced colic and a repugnance to food;

and the wine and brandy which they took to excite their appetite were disgusting to them, and did not remove the clammy taste which they had constantly in their mouths. This man could not continue long at work. After ten days of this employment, he was seized with vomiting, severe colic, accompanied by constipation, which persisted and increased in intensity so much that he rolled on the floor in agony. On the day of admission, he continued to vomit, and to suffer severe abdominal pain. The vomited matters were bilious, and he rejected all his food almost immediately after swallowing it; he had had no stool for five days; the belly otherwise was natural, the tongue whitish; he had no appetite, was free from fever, but was sleepless. The next day, 20th April, the bowels were opened by two ounces of sulphate of magnesia, and the painter's purgative clyster, as used in La Charité—(this consists of twelve ounces of wine, with six of oil). The free evacuation of the bowels, and the administration of two and a half grains of opium, were followed by cessation of vomiting and diminution of the pain. From this time to 26th April, after having taken from six to twelve grains of gamboge daily, and using frequent clysters and medicated baths, he became convalescent, and was dismissed cured on 4th May.

From the whole history of the case, there appeared to be no doubt that this man suffered from a genuine zinc colic. To ascertain that it was really oxide of zinc which had caused the illness, M. Bouvier collected, by washing the surface of his body, the metallic particles which adhered to it, and found them to consist of oxide of zinc. We are not entitled from this to say that the oxide of zinc is as noxious as white lead; but it shows, at least, that some precautions require to be taken by those who work with it, in order to preserve their health.—*Compte Rendu de l'Académie des Sciences*, May, 1850, in *Bulletin de Thérapeutique*.

II. *Zinc Poisoning observed in the Workmen employed in twisting Galvanized Wire.* By MM. LANDOUZY and MAUMENE, of Rheims. The iron wire employed for securing the corks of champagne is sent in bundles of one to ten kilogrammes to workmen called *tordeurs*, who, by a dextrous manœuvre, cut and twist from ten to twenty threads of wire at a time. These wires are then made up in packets of one kilogramme, and, after being beaten with a bit of wood to make them even, are packed in bundles. Although this sort of work had been followed by the same workmen from eight to fifteen years under very bad hygienic circumstances as regards ventilation, they never had experienced any evil effects from it till the beginning of January, 1850, when the so-called galvanized wire (which is iron wire covered with a layer of zinc) was substituted for the common iron wire; and, soon after, the workmen began to complain of the taste as of a sweetish powder in the throat, an incessant tendency to cough and spit, shiverings, and general malaise. The whole of the people employed in this branch of industry—two youths, two women, and two men—were affected with symptoms which were referable to zinc. Four had symptoms of general depression, with sore throat, swelling and ulceration of the tonsils, inflammation of the palate, white pellicles on the gums, salivation, fetid breath, colic, and diarrhoea. In one, the colic and diarrhoea were the only symptoms observed; in another, the colic was accompanied by nausea, tenesmus, and obstinate constipation. The wires with which they worked had been made hurriedly and carelessly, and were covered with a dusty powder, which escaped abundantly during the twisting, and especially the beating, of the wires. This powder consisted of zinc, oxide and carbonate of zinc, alloy of zinc and iron, and oxide of iron. It contained no trace of lead.

These symptoms seem to have subsided readily, without treatment, on abandoning the occupation. With one exception, all the work-people returned to their work in from three to six days.

That the symptoms were due to the exposure to the dust appears from the circumstance that, in fifteen days more, the same work-people, in the same hygienic circumstances, resumed the same work, with the same galvanized iron, but free from all dust, and none of these phenomena manifested themselves which were formerly observed.—*Monthly Journ.*, Aug. 1850, from *Gaz. Méd. de Paris*, 1st June, 1850.

57. *Case of Fatal Poisoning by Sir William Burnett's Fluid.* Reported by H. LETHEBY, M. B. (*Proceedings of Royal Med.-Chirurg. Soc.*, June 11th, 1850.)—The author commenced by expressing his belief that no fatal case of poisoning by chloride of zinc is on record—a remarkable fact, as the very commonly employed deodorizing fluid referred to is a strong solution of this poisonous salt. It will be found that the writings of the leading toxicologists, English and French, contain no mention of this salt as a possible source of danger to the community. The case related is that of a little girl, aged fifteen months, at Reddingfield, in Suffolk. Mr. Miller, of Eye, in the same county, was called to her on the 16th of August, 1849. She was in a semi-comatose state, the vital powers being much prostrated, the countenance pale and anxious, the breathing thoracic and rapid, the pulse quick and fluttering, and the general surface of the body cold, and bedewed with perspiration. The swelling of the lips, and the thick transparent mucus adhering to them, led to further examination, and the lining membrane of the mouth was found to have the appearance of having undergone the action of a corrosive substance. The child had been well in the morning, and only an hour and a half before Mr. Miller saw her, had been seized with most violent sickness. A bottle of Sir William Burnett's fluid had been supplied to the mother some days previously, in consequence of some cases of fever in the house she inhabited. On rousing the child, it craved for cold water, which evidently refreshed its mouth; but little, if any, could be swallowed, and it was partly returned by the nostrils. The throat was evidently swollen and painful. No relief could be given; vomiting of a frothy liquid took place at intervals, but the coma became deeper, the respiration slower, the pulse more feeble, and, ten hours after the symptoms had commenced, the child died. The body was examined twenty-two hours after death. Marks of the corrosive poison were found on the lips, lining membrane of the mouth, fauces, and œsophagus, which were white and opaque. The outer surface of the stomach had a mottled appearance, from ramifications of dark purple vessels; the intestines looked paler than natural. The stomach felt hard and leathery, and contained an ounce and a half of a fluid resembling curds and whey. Its inner surface was corrugated, opaque, and tinged of a dark leaden hue: this appearance ceased abruptly at the pylorus. The lungs were slightly congested; the auricles of the heart full of dark, semi-fluid coagula; the ventricles empty. The kidneys were much congested. The interior of the stomach was slightly acid to litmus paper, and, on digesting the organ in one ounce of distilled water, the liquid obtained gave white precipitates with prussiate of potash, carbonate of soda, sulphuretted hydrogen, and acid nitrate of silver, no precipitate being obtained on the addition of a soluble salt of baryta. The presence of chloride of zinc was thus demonstrated. The fluid matter taken from the stomach, and that ejected by vomiting, on being filtered and tested, gave the same reaction. The tissue of the stomach was then broken up with nitro-muriatic acid, the solution evaporated to dryness, re-dissolved in distilled water, filtered, and precipitated with sulphuretted hydrogen, by which means 3.8 grains of sulphuret of zinc were obtained, a quantity equal to 3.2 grains of the oxide, and 5.4 of the chloride of the metal. The fluid in the possession of the mother had a density of 1600, was slightly acid, and contained fifty-two per cent. of the solid chloride. Experiments made with this liquid, in order to determine its leading chemical and physiological characters, showed—1st. That the chloride of zinc is distinguished from the other salts of the metal by its quick and firm coagulating action on liquid albumen and on the delicate tissues of the body. 2dly. That a solution of chloride of zinc exerts a twofold action on the living animal economy. Its first effect is that of an irritant and caustic; the liquid coagulates the tissues, and gives pain in the part to which it is applied, and almost instantaneous vomiting. It appears, moreover, from the investigations of Orfila, that the salts of zinc act upon the stomach, not only when they are introduced into this organ, but also when they are injected into the blood-vessels of the body, or applied to a wounded surface. The second effects are of a constitutional nature; and it would appear that the poison exerts a distinct and specific action on the motor and organic system of nerves, for, soon after the poison gains access to

the circulation, the breathing and pulse become accelerated, paralysis of the voluntary muscles commences, the surface of the body grows cold, the pupil is dilated; the circulation and respiration become more and more affected, and lastly the brain suffers, coma supervenes, and death takes place without a struggle. The author stated, moreover, that his experiments prove the poison to be absorbed from the alimentary canal, and carried into the general circulation. He has detected the metal in the blood removed from the heart, in the tissues of the body, and in the urine excreted during life. The appearances presented by the blood indicate that the poison exerts some peculiar action on this fluid, which is found black and uncoagulated, and the cavities of the heart are distended as if the organ had lost the power of contracting on its contents.

Mr. Ure said that the chloride of zinc had been found of much service in surgery. He had used it pretty extensively, and some years since had pointed out its remarkable affinity for albumen. In his practice, no symptoms indicative of its absorption into the system had been manifested. He agreed with the author of the paper respecting the action of sulphate of zinc on the economy.

Dr. Letheby remarked that his experiments went to confirm the observations made by Mr. Ure as to the great insolubility of the coagulum formed by albumen and the chloride of zinc. He had observed, for instance, that when an albuminous tissue, as the stomach of an animal, had been acted upon by this agent, and was afterwards steeped in water for a length of time, it would neither dissolve nor decompose, nor even yield up the bulk of the salt with which it was in combination. This was evidence of the great affinity of this compound for albumen. He considered that the chloride of zinc might generally be used as a caustic, with little fear of its entering the circulation, or of producing effects on the general system. His investigations, however, had shown that when given internally the poison invariably found its way into the circulation. In the cases before the Society, he had been able to detect the metal, not only in the animal tissues, and in the blood taken from the heart, but also in the urine voided by the animal during its lifetime.—*Lancet*, July 6, 1850.